

**Practice: 430 - Irrigation Pipeline****Scenario: #1 - Buried Pipe Less Than or Equal to 2 Inch Diameter****Scenario Description:**

Description: Below ground installation of main, submain, etc. PVC or PE pipeline. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenario- Install 1000 feet of 1.5-inch, Sch 40 PVC ASTM 1785 (0.52 #/ft ) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$2,635.65

**Scenario Cost/Unit:** \$2.64

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$4.78	7	\$33.46
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.15	1000	\$1,150.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	16	\$307.36
<b>Materials</b>						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.47	598	\$879.06
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$265.77	1	\$265.77

**Practice: 430 - Irrigation Pipeline****Scenario: #2 - Buried Pipe Greater Than 2 Inch Diameter and Less Than 6 Inch Diameter****Scenario Description:**

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch; Scenerio: Install 1000 feet of 4-inch, Sch 40 PVC (2 #/ft ) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$5,137.59

**Scenario Cost/Unit:** \$5.14

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$4.78	7	\$33.46
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.15	1000	\$1,150.00
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	16	\$307.36
<b>Materials</b>						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.47	2300	\$3,381.00
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$265.77	1	\$265.77

**Practice: 430 - Irrigation Pipeline****Scenario: #3 - Buried Pipe Greater Than or Equal to 6 Inch Diameter****Scenario Description:**

Description: Below ground installation of main, submain, etc. PVC or PE pipeline.. PVC (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 1-inch to 24-inch. Scenario Install 1000 feet of 6-inch, Sch 40 PVC (3.6 #/ft ) pipeline with appurtenances.. Pipeline installed below ground with a minimum of 2 feet of ground cover. Appurtenances include: couplings, fittings, air vents, pressure relief valves, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline needed to replace or supplement inefficient irrigation conveyance systems.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$7,842.39

**Scenario Cost/Unit:** \$7.84

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Trenching, Earth, 12" x 48"	53	Trenching, earth, 12" wide x 48" depth, includes equipment and labor for trenching and backfilling	Foot	\$1.15	1000	\$1,150.00
Earthfill, Manually Compacted	50	Earthfill, manually compacted, includes equipment and labor	Cubic yard	\$4.78	7	\$33.46
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	16	\$307.36
<b>Materials</b>						
Pipe, PVC, dia. < 18", weight priced	1323	Polyvinyl Chloride (PVC) pressure rated pipe priced by the weight of the pipe materials for pipes with diameters less than 18". Materials only.	Pound	\$1.47	4140	\$6,085.80
<b>Mobilization</b>						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	\$265.77	1	\$265.77

**Practice: 430 - Irrigation Pipeline****Scenario: #4 - Surface HDPE****Scenario Description:**

Description: Surface installation of HDPE (Iron Pipe Size & Tubing) pipeline. Typical size of pipe installed: 1-inch to 4-inch; Install 1000 feet of 1½-inch, Class 200 (SDR-9.0, PE4708), HDPE pipe weighs 0.43 lb/ft Appurtenances include: couplings, fittings, anchors, tees, air vents, thrust blocks, gate valves, air release valves, drain valve, and pressure relief valve, etc. and are included in the cost of pipe material (additional 15% of pipe material quantity). Revegetation is not included. Appurtenances include: fittings, air vents, pressure relief valves, anchors, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe Cost of appurtenances does not include flow meters or backflow preventers. HDPE Pipeline with appurtenances, on the ground surface, next to fenceline. Typical installation applies to soils with no special requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline leaking, too small for efficiency, needs replacement or supplement irrigation conveyance system.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 1,000

**Scenario Cost:** \$1,529.34

**Scenario Cost/Unit:** \$1.53

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Equipment/Installation</b>						
Fuser for HDPE Pipe	1383	Fusing machine for 1" to 12" diameter HDPE pipe joints. Equipment costs only. Does not include labor.	Hour	\$22.97	4	\$91.88
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	12	\$230.52
<b>Materials</b>						
Pipe, HDPE, smooth wall, weight priced	1379	High Density Polyethylene (HDPE) compound manufactured into smooth wall pipe. Materials only.	Pound	\$2.29	495	\$1,133.55
<b>Mobilization</b>						
Mobilization, very small equipment	1137	Equipment that is small enough to be transported by a pick-up truck with typical weights less than 3,500 pounds. Can be multiple pieces of equipment if all hauled simultaneously.	Each	\$73.39	1	\$73.39

**Practice: 430 - Irrigation Pipeline****Scenario: #5 - Surface Steel - Iron Pipe Size****Scenario Description:**

Description: On-ground surface installation of Steel (Iron Pipe Size) pipeline. Steel (IPS) is manufactured in sizes (nominal diameter) from ½-inch to 36-inch; typical practice sizes range from 2-inch to 18-inch; and typical scenario size is 2-inch. Construct 1/4 mile (1,320 feet) of 2-inch, Schedule 40, Galvanized Steel Pipe with appurtenances, installed on the ground surface. The unit is weight of pipe material in pounds. 1,320 feet of 2-inch, Schedule 40, Galvanized Steel Pipe weighs 3.653 lb/ft, or a total of 4,822 pounds. Appurtenances include: couplings, fittings, air vents, pressure relief valves, anchors, expansion joints, thrust blocks, risers, and inline valves, and are included in the cost of pipe material (additional 15% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline leaking, too small for efficiency, needs replacement or supplement irrigation conveyance system.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 1,320

**Scenario Cost:** \$8,957.56

**Scenario Cost/Unit:** \$6.79

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	16	\$307.36
<b>Materials</b>						
Pipe, steel, smooth wall, galvanized, weight priced	1381	Steel manufactured into galvanized smooth wall pipe	Pound	\$1.56	5545	\$8,650.20

**Practice: 430 - Irrigation Pipeline****Scenario: #6 - Surface Aluminum - Aluminum Irrigation Pipe****Scenario Description:**

Description: On-ground surface installation of Aluminum Irrigation Pipe (AIP) pipeline. AIP is manufactured in sizes (nominal diameter) from 2-inch to 12-inch; typical practice sizes range from 6-inch to 12-inch; and typical scenario size is 8-inch. Construct 1/8 mile (660 feet) of 8-inch, 0.050-inch wall, Aluminum Irrigation Pipe (AIP) with appurtenances, installed on the ground surface. The unit is weight of pipe in pounds of pipe material. 660 feet of 8-inch, 0.050-inch wall, AIP weighs 1.47 lb/ft, or a total of 970 pounds. Appurtenances include: couplings, fittings, air vents, risers, and inline valves, and are included in the cost of pipe material (additional 10% of pipe material quantity). Cost of appurtenances does not include flow meters or backflow preventers. Typical installation applies to soils with no special bedding requirements.

Resource Concerns: Inefficient Use of Irrigation Water; Inefficient Energy Use.

Associated Practices: 436 - Irrigation Reservoir; 441 - Irrigation System, Microirrigation; 442 - Irrigation System, Sprinkler; 443 - Irrigation System, Surface & Subsurface; 447 - Irrigation System, Tailwater Recovery; 533 - Pumping Plant; 634 - Waste Transfer.

**Before Situation:**

Pipeline leaking, too small for efficiency, needs replacement or supplement irrigation conveyance system.

**After Situation:**

Pipeline installed to convey and/or distribute water to irrigation systems or reservoirs, minimizing non-beneficial water use, reducing soil erosion, and/or reducing energy use.

**Scenario Feature Measure:** Pipe Length

**Scenario Unit:** Linear Foot

**Scenario Typical Size:** 660

**Scenario Cost:** \$4,508.98

**Scenario Cost/Unit:** \$6.83

**Cost Details (by category):**

Component Name	ID	Component Description	Unit	Price (\$/unit)	Quantity	Cost
<b>Labor</b>						
General Labor	231	Labor performed using basic tools such as power tool, shovels, and other tools that do not require extensive training. Ex. pipe layer, herder, concrete placement, materials spreader, flagger, etc.	Hour	\$19.21	8	\$153.68
<b>Materials</b>						
Pipe, aluminum, smooth wall, weight priced	1382	Aluminum manufactured into smooth wall pipe	Pound	\$4.49	970	\$4,355.30